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COMPARISONS OF CORONARY ARTERY ENDOTHELIAL FUNCTION AFTER NOBORI AND XIENCE V STENT IMPLANTATION IN SWINE MODEL

i2 Poster Contributions
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Session Title: Prevention and Treatment of Restenosis
Abstract Category: 23. Restenosis: Pre-Clinical Research
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Background: Endothelial dysfunction after drug eluting stent (DES) implantation is considered to be partly associated with late stent thrombosis. However coronary endothelial function after 2nd generation DESs implantation has not been well examined.

Methods: 18 coronary vessels of 7 Yorkshire pigs were randomly allocated to 2 groups and Nobori or Xience V stents (n=9 vessels/each) were implanted. One month after stent implantation, all animals underwent repeat angiogram and in-vivo vasomotor function test following euthanasia for ex-vivo endothelial function test, histology and microarray gene analysis.

Results: One month after stent implantation, Nobori stents showed better results in QCA and histology as compared to Xience V (Table). After intracoronary acetylcholine injection, 4 vessels for Nobori (44%) and 9 vessels for Xience V (100%) showed vasoconstriction in stented distal segments (p=0.031). However there is no significant difference in %diameter change as well as ex-vivo endothelial function between 2 groups. Microarray analysis of stented vessel tissue revealed that the gene expressions of some cytokines and chemokines involved in inflammatory and immune responses were lower in Nobori as compared to Xience V.

Conclusions: Although in-vivo and ex-vivo endothelial function tests showed no difference between 2 groups, with regards to histopathological analysis, Nobori stent demonstrated lower inflammatory and immune responses as compared to Xience V in the gene array analysis.

	Nobori® stent	Xience V® stent	p value
Quantitative Coronary Angiography (QCA)			
Minimal Lumen Diameter (mm)	2.29±0.21	1.52±0.49	0.001
Late Lumen Loss (mm)	0.76±0.2	1.22±0.3	0.005
%Diameter Stenosis (%)	21±5	39±13	0.002
Histomorphology			
Neointimal Thickness (μm)	113±60	414±218	0.02
Neointimal Area (mm2)	1.21±0.68	3.34±1.70	0.036
%Area Stenosis (%)	21±7	43±18	0.037
Histopatology			
Inflammatory Cell Score	1.20±0.45	2.25±0.88	0.051
Mural Injury Score	0.40±0.55	2.08±1.07	0.018
Fibrin Deposition Score	1.27±0.28	2.25±0.50	0.01
In-vivo Vasomotor Function Test	Acetylcholine (10-6 M/ml)		
%Diameter Change (proximal, %)	-8±13	-9±10	0.48
%Diameter Change (distal, %)	0.7±4	-4±3	0.37
Ex-vivo Endothelial Function Test	Superoxide Anion (O2-) Production (RLU/s/mg)		
Proximal Segments	87.6±62.1	7.5±1.7	0.27
Distal Segments	24.1±11.1	16.9±8.8	0.62
Microarray Pathway Analysis	cut off: p<0.05, fold change>2		
Genes Downregulated in Nobori as Compared to Xience V	MCP-1, TNF, CCR7, IL-1β, IL-2Rγ, P-Selectin, L-Selectin, Flk-1, Integrin-β2, Complement factor B		
Genes Upregulated in Nobori as Compared to Xience V	Adiponectin C1q		